

REMARKS/ARGUMENTS

The Applicants have carefully reviewed the Examiner's Official Action dated February 26, 2009, in which the Examiner rejected claims 1-3, 11, 14-20, 23-28.

The Office Action rejected original claims 1 and 11 under 35 USC 103(a) as being unpatentable over Fuji (US 6,159,421) in view of Hirano (US 6,774,561); original claims 2 and 3 under 35 USC 103(a) as being unpatentable over Fuji in view of Ogawa et al. (US 6,106,955); original claim 14 under 35 USC 103(a) as being unpatentable over Fuji in view of Hayashi et al. (JP 2001187390); original claim 15 under 35 USC 103(a) as being unpatentable over Fuji in view of Watanabe et al. (US 5,853,866) or over Fuji in view of Greenberg et al. (US 7,049,002); original claim 16 under 35 USC 103(a) as being unpatentable over Fuji in view of Watanabe et al. or over Fuji in view of Ogawa and Greenberg et al.; original claims 17-20 and 23 under 35 USC 103(a) as being unpatentable over Fuji in view of Greenberg et al. and Ogawa et al.; original claim 24 under 35 USC 103(a) as being unpatentable over Fuji in view of Greenberg et al., Ogawa et al. and Hayashi; and original claims 25-28 under 35 USC 103(a) as being unpatentable over Fuji in view of Kim. **These rejections are respectfully traversed on the grounds that none of the cited references discloses or suggests a photoelectron generating plate in which the photoelectron generating layer or the photoelectron generating member generates negative particles or photoelectrons by the illumination of the light, as recited in each of independent claims 1, 15, and 25.**

Instead of generating negative particles by the illumination of light, Ogawa, Watanabe and Greenberg use photocatalytic materials, and in particular TiO₂,

which change the reaction velocity between the reaction materials or improve the reaction between the reaction materials, and which does not change itself. In other words, the materials disclosed in the prior art, like any "catalyst," merely enhance reactions and do not actually react to generate the negative particles or photoelectrons. The term "photocatalytic" refers to the fact that the catalytic processes are activated by light, and not to generation of negative particles in response to the light. Thus, Ogawa, Watanabe and Greenberg merely disclose the use of photocatalytic materials and do not disclose the photoelectron generating layer or the photoelectron generating member. Further, Ogawa, Watanabe and Greenberg do not disclose the feature of emitting negative particles or photoelectrons. Therefore, it would not have been obvious to those skilled in the art to combine the cited references to obtain the claimed invention.

Further, in accordance with the present invention of claims 1, 15 and 25, a thickness of the photoelectron emission layer is greater than a maximum surface roughness of an underlying layer thereof.

The Office Action mentions that Fuji does not disclose the feature that a thickness of the photoelectron emission layer is greater than a maximum surface roughness of an underlying layer thereof. However, the Office Action alleges that Hirano discloses a light emitting device having a metal film being covered by a buffering thin film. Instead, Hirano discloses a light emitting device having a metal film being covered by a buffering thin film, which is not a photoelectron generating layer. Instead, Hirano discloses that if the display unit is required to have a certain level of luminance, the buffering thin film 3 should be as thin as possible so long as it covers the surface roughness of the metal film 2. Neither the buffering thin film 3 or the metal film 2 of Hirano is a photoelectron generating layer. To the contrary, the buffering thin film 3 and the metal film 2 of Hirano constitute a **lower electrode**. Thus, the buffering film 3 and the metal film 2 does

not generating electrons by the photoelectric effect, and the buffering film 3 and the metal film 2 merely constitutes the **lower electrode** and reflects the light, **which has nothing to do with, and is not suggestive of, the claimed negative particle generating layer.**

More specifically, in the background art of Hirano, it is disclosed that the light-emitting device has a lower electrode 102 as an anode of metallic material formed on a substrate 101 and an organic layer 106 including an organic hole injection layer 103, an organic hole transporting layer 104, and an organic emission layer 105 or the like, which are sequentially laid on over the other on the other on the lower electrode 102; and, on this organic layer 106 is formed an upper electrode 107 as a cathode which is a thin film of metallic material transparent to light and is further formed a transparent conductive film 108 to reduce the resistance of the upper electrode 107 as a cathode; the light-emitting device of such structure is a display element of so-called "top emitting type", which works in such a way that the light generated by the organic emission layer 105 is reflected by the lower electrode 102 of metallic material and is allowed to emanate through the upper electrode 107 placed opposite to the substrate 101. In this arrangement, all the layers of metallic material tend to have polycrystalline structure no matter whether they are formed by sputtering, resistance heat vapor deposition, or electron beam vapor deposition so that, as a result, the lower electrode 102 formed by patterning the layer of metallic material has projections on its surface due to marked surface roughening. Consequently, the organic layer 106 formed on the lower electrode 102 becomes locally thin at spots corresponding to projections, with the result that the distance d across the organic layer 106 between the lower electrode 102 and the upper electrode 107 becomes locally short and the electric field concentrates at such spots to cause leakage current(Hirano, col. 1, lines 13 – 65). To solve this

"leakage current" problem, Hirano forms the buffering thin film 3 on the metal film 2 in order to address the problem. Because the buffering thin film 3 and the metal film 2 which constitute the lower electrode merely reflect the light generated by the organic emission layer, and does not generate negative particles or photoelectrons, Hirano does not disclose and could not possibly have suggested the feature that a thickness of the photoelectron emission layer is greater than a maximum surface roughness of an underlying layer thereof. As a result, it would not have been obvious to those skilled in the art to combine cited references to obtain the present invention, and the present invention as recited in claims 1, 15, 25 and dependent claims thereof being provided with features that are not disclosed in the cited references is not obvious over the disclosures of the cited references. Withdrawal of the rejection to claims 1, 15, 25 and dependent claims thereof is accordingly requested.

Furthermore, in accordance with the present invention of claims 14 and 24, oxygen gas runs through the surface of photoelectron generating plate to thereby have negative particles generated. In other words, in order to generate negative particles, when oxygen gas runs through the surface of photoelectrons generating plate, oxygen containing negative particles are generated. In contrast, Hayashi produces ozone or OH radical. Thus, the present invention is different from Hayashi, and Hayashi does not disclose, teach or suggest the feature that generating oxygen-containing negative particles. Thus, it would not have been obvious to those skilled in the art to combine the cited references to obtain the invention of claims 14 and 24.

In view of the above, It is respectfully requested that the rejections of the claims of the present application be withdrawn and that all of the pending claims be allowed in their present form.

CONCLUSION

Applicant believes that this is a full and complete response to the Office Action. For the reasons discussed above, applicant respectfully submits that the pending claims are in complete condition for allowance. Accordingly, it is respectfully requested that the Examiner's rejections be withdrawn; and that claims 1-8 be allowed in their present form.

Should the Examiner require or consider it advisable that the specification, claims an/or drawings be further amended or corrected in formal respects, in order to place the case in condition for final allowance, then it is respectfully requested that such amendment or correction be carried out by Examiner's Amendment and the case be passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing this case to allowance, the Examiner is invited to telephone the undersigned.

Respectfully submitted,
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